

ABSTRACT OF THE DISCLOSURE

Disclosed are an ion implantation method capable of dramatically increasing an implantation rate of hydrogen ions into a semiconductor substrate and a method for manufacturing an SOI wafer, in which manufacturing efficiency of the SOI wafer is sufficiently high. When the hydrogen ions are implanted to a predetermined depth of the semiconductor substrate, hydrogen gas is introduced into a chamber where an inner pressure is reduced and a predetermined magnetic field is formed, plasma is generated by introducing a microwave into the magnetic field, hydrogen ion beams containing hydrogen molecule ions is extracted from the plasma, and the hydrogen molecule ions are irradiated and implanted onto the semiconductor substrate. Thus, a throughput in the hydrogen ion implantation is improved, thus making it possible to enhance the manufacturing efficiency of the SOI wafer.